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| 09/529,192      | 06/26/2000  | THOMAS JUNG          | SPM-290-A           | 9266             |

7590 03/11/2003  
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EXAMINER

MARKHAM, WESLEY D

| ART UNIT | PAPER NUMBER |
|----------|--------------|
|----------|--------------|

1762

DATE MAILED: 03/11/2003

23

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/529,192

Applicant(s)

JUNG ET AL.

Examiner

Wesley D Markham

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 22 October 2002 and 23 December 2002.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,4-9 and 12-36 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,4-9 and 12-36 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 June 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 23 December 2002 is: a) ☐ approved b) ☒ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____  |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                          | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>21</u> . | 6) <input type="checkbox"/> Other:  |

## **DETAILED ACTION**

### ***Response to Amendment***

1. Acknowledgement is made of applicant's amendment F, filed as paper #22 on 12/23/2002 (with a certificate of mailing dated 12/13/2002), in which the specification of the instant application was amended, Claim 3 was canceled without prejudice, Claims 1, 4 – 6, 8, 9, 12 – 18, and 21 – 24 were amended, and Claims 25 – 36 were added. Claims 1, 4 – 9, and 12 – 36 are currently pending in U.S. Application Serial No. 09/529,192, and an Office Action on the merits follows.

### ***Information Disclosure Statement***

2. The information disclosure statement filed on 10/22/2002 as paper #21 fails to comply with 37 CFR 1.98(a)(3) because it does not include a concise explanation of the relevance, as it is presently understood by the individual designated in 37 CFR 1.56(c) most knowledgeable about the content of the information, of each patent listed that is not in the English language, specifically documents (1) EP 0 879 897 A1 and (2) DD 294 511 A5. The IDS has been placed in the application file, but the aforementioned two documents have not been considered.

### ***Drawings***

3. The proposed drawing correction and/or the proposed substitute sheets of drawings (i.e., the one sheet of drawings adding a voltage source to Figure 1), filed on 12/23/2002 have been disapproved because they introduce new matter into the

drawings. 37 CFR 1.121(f) states that no amendment may introduce new matter into the disclosure of an application. The original disclosure does not support the showing of the placement of the voltage source added to Figure 1. Specifically, voltage source added to Figure 1 in the proposed drawing correction is shown as being outside of the discharge region "2". In the specification as originally filed, there is no indication as to the placement of the voltage source (i.e., the specification as originally filed does not disclose the placement of the voltage source as being either within the discharge region or outside of the discharge region).

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#### ***Claim Objections***

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4. The objections to Claims 1 and 23, set forth in paragraph 3 of the previous Office Action (i.e., the non-final Office Action, paper #19, mailed on 8/13/2002), are withdrawn in light of applicant's amendment F.
5. Claims 14, 23, and 24 are objected to because of the following informalities:
  - Claim 14: The phrase, "...said discharge activated by the activating voltage, the activating voltage only at least one of a DC voltage..." appears to contain a typographical error. The applicant is suggested to amend the phrase to read, "...said discharge activated by the activating voltage, the activating voltage being only at least one of a DC voltage..."
  - Claim 23: The phrase, "A process for surface treatment of a substrate, the substrate one of an electrically conducting substrate..." appears to contain a typographical error. The applicant is suggested to amend the phrase to read,

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"A process for surface treatment of a substrate, the substrate being one of an electrically conducting substrate..."

- Claim 24: The phrase, "A device for surface treatment of a substrate, the substrate one of an electrically conducting substrate..." appears to contain a typographical error. The applicant is suggested to amend the phrase to read, "A device for surface treatment of a substrate, the substrate being one of an electrically conducting substrate..."

Appropriate correction is required.

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***Claim Rejections - 35 USC § 112***

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. The rejection of Claims 1, 3 – 9, and 12 – 24 under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention, set forth in paragraphs 5 – 8 of the previous Office Action, is withdrawn in light of applicant's amendment F.
8. Claims 1, 4 – 9, 12 – 22, 25 – 31, and 33 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

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9. Independent Claim 1 (from which Claims 4 – 9, 12, 13, and 25 – 27 depend) recites the limitation "the substrate surfaces" in line 6 of the claim. There is insufficient antecedent basis for this limitation in the claim. For the purposes of examination only, the examiner has interpreted the phrase "the substrate surfaces" in line 6 of Claim 1 to be equivalent to "the surfaces to be treated".
10. Regarding independent Claim 14 (from which Claims 15 – 22 and 28 – 31 depend), the claim recites, in part, "an anode placed proximate to the at least one substrate and is operable to receive an activating voltage". This limitation renders the claims vague and indefinite because it is unclear whether the anode is "operable to receive and activating voltage" or the substrate is "operable to receive an activating voltage". As such, the scope of the claims is unclear. The examiner notes that a review of the applicant's specification does not appear to shed light on the aforementioned issue.
11. Regarding Claim 22, the claim recites, in part, "...deflection elements arranged in the vacuum chamber near one of the device components in which parasitic discharges could be formed due to their potentials..." It is unclear whether "their potentials" in the aforementioned phrase refers to the potentials of the "deflection elements", the "device components", or both. As such, the scope of the claim is unclear, and the claim is vague and indefinite. Also regarding Claim 22, the term "near" is a relative term that renders the claim indefinite. The term "near" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably

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apprised of the scope of the invention. Specifically, how close to one of the device components do the deflection elements have to be placed to be considered "near" the device component(s)?

12. Regarding Claim 33, the claim recites, in part, "The process according to Claim 33 wherein..." It is unclear how a claim can depend from itself. Therefore, the claim is vague and indefinite. For the purposes of examination only and in light of the applicant's remarks filed on 12/23/2002, the examiner has interpreted Claim 33 as depending from Claim 32.

13. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

14. Claims 23, 24, and 32 – 36 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.
15. Regarding amended independent Claim 23 (from which Claims 32 and 33 depend), the claim requires, in part, that elements of the surface treatment process including means for activating the hollow-cathode glow discharge be integrated outside of the discharge region. Regarding amended independent Claim 24 (from which Claims 34 – 36 depend), the claim requires, in part, that elements of the device including

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means for supplying electrical energy be integrated outside of the discharge region. The applicant's specification as originally filed does not specify the location of the means for activating the hollow-cathode glow discharge / supplying electrical energy (i.e., whether it is located within or outside of the discharge region). As such, Claims 23, 24, and 32 – 36 contain subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

16. Please note that, in light of applicant's amendment F and corresponding remarks, the rejections under 35 U.S.C. 102(b), 35 U.S.C. 102(e), and 35 U.S.C. 103(a) based on Echizen et al. (USPN 5,527,391) and Vanden Brande et al. (USPN 6,099,667), alone and in various combinations, set forth in paragraphs 10 – 35 of the previous Office Action, are withdrawn. Specifically, regarding the Echizen et al. reference, the reference does not teach or reasonably suggest the types of activating voltages (DC, pulsed DC, and AC up to a specific frequency) required by amended independent Claims 1 and 14 or the integration of the process / device elements outside of the discharge region required by amended independent Claims 23 and 24. Regarding the Vanden Brande et al. reference, the applicant's submission that the foreign priority document (DE 197 44 060.6) filed on 10/6/1997 is the same as the International Application as originally filed, and therefore the English language translation is the same and was received by the Office on



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4/6/2000 (with a certificate of translation dated 4/3/2000), is sufficient to remove the Vanden Brande et al. reference as prior art under 35 U.S.C. 102(e)/103(a).

***Claim Rejections - 35 USC § 102***

17. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

18. Claims 1, 4, 7 – 9, 12 – 14, 16, 17, 26, and 29 are rejected under 35 U.S.C. 102(b) as being anticipated by Yamada (JP 63-026373 A).
19. Regarding independent Claim 1, Yamada teaches a process for surface treatment of at least one electrically conducting substrate or a substrate that has been coated to be electrically conducting (i.e., an electrically conductive tube "7") (Abstract), the process comprising placing a gas in a region of an electric discharge, specifically inside the tube (Abstract), restricting the discharge region on at least two opposite sides by surfaces to be treated, wherein the surfaces to be treated are supplied by at least one substrate (i.e., the tube) and form a hollow cathode used to enable hollow-cathode glow discharge (Abstract), and treating the substrate surfaces by a hollow-cathode glow discharge, said discharge activated only by at least one of a DC voltage, a pulsed DC voltage, and an AC voltage having a frequency of up to 50 MHz (Abstract). Specifically, the electrically conductive tube "7" of Yamada restricts

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the discharge region on all sides and is coated by using hollow-cathode glow discharge (Abstract). Regarding independent Claim 14, Yamada teaches a device for surface treatment of at least one electrically conducting substrate or a substrate that has been coated to be electrically conducting (i.e., an electrically conductive tube "7") (Abstract), the device comprising a discharge region enclosed on at least two sides (i.e., all sides) by substrate surfaces of at least one substrate (i.e., the electrically conductive tube surfaces) (Abstract), means for supplying electrical energy to the discharge region (reference number "6" in Figure 1), a vacuum chamber to enclose the discharge region (reference number "1" in Figure 1), a means for supplying gas to the vacuum chamber (reference number "8", a gas nozzle, in Figure 1), means for removing gas from the vacuum chamber (reference number "2", air exhaust port, in Figure 1), and an anode placed proximate to the at least one substrate and is operable to receive an activating voltage (reference number "1", the vacuum chamber that acts as the anode, in Figure 1), wherein the substrate surfaces form a hollow cathode used to enable hollow-cathode glow discharge, and wherein the at least one substrate is surface treated by the hollow-cathode glow discharge, said discharge activated by the activating voltage, the activating voltage being only at least one of a DC voltage, a pulsed DC voltage, and an AC voltage having a frequency of up to 50 MHz (Abstract).

20. Yamada also teaches all the limitations of Claims 4, 7 – 9, 12, 13, 16, 17, 26, and 29 as set forth above in paragraph 19 and below, including a process / device wherein / further comprising:

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- Claim 4: The at least one substrate is band-shaped. Specifically, Yamada teaches using an electrically-conductive tube as a substrate (Abstract). As a tube is nothing more than a band that has been given a desired shape and curvature, the examiner has broadly but reasonably interpreted the tube of Yamada to be "band-shaped".
- Claim 7: The electric discharge occurs at a pressure of between 0.01 mbar (.007 Torr) and 100 mbar (75 Torr). Specifically, Yamada teaches a pressure of 0.5 to 10 Torr in the discharge region (i.e., the region inside of the electrically-conductive tube) (page 422, section 4, as verified by an oral translation from a USPTO translator).
- Claim 8: The at least one substrate is grounded. Specifically the substrate "7" of Yamada is connected as an electrode to a voltage source "6" that is connected to ground (Figure 1 and Abstract), and therefore the substrate is "grounded".
- Claim 9: The voltage applied between the at least one substrate and a plasma formed by the electric discharge is between one and 3000 volts. Specifically, Yamada teaches an applied DC voltage of 300 to 450 volts, which is within the applicant's claimed range (page 422, section 4, as verified by an oral translation from a USPTO translator).
- Claims 12 and 16: Feeding the gas / arranging the gas supply in one of the discharge region and an area immediately outside the discharge region (Abstract, Figure 1, gas nozzle "8", and gas discharge port "9").

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- Claims 13 and 17: Removing the gas / arranging the gas removal means in one of the discharge region and an area immediately outside the discharge region (Abstract, Figure 1, air exhaust port "2", and page 422, section 3, as verified by an oral translation from a USPTO translator).
- Claims 26 and 29: The hollow-cathode activating voltage is one of a DC voltage, a pulsed DC voltage having a specific pulse frequency, and an AC voltage having a specific frequency. Specifically, Yamada teaches a DC voltage (Abstract).

***Claim Rejections - 35 USC § 103***

21. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

22. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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23. Claims 6, 25, and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada (JP 63-026373 A).
24. Yamada teaches all the limitations of Claims 6, 25, and 28 as set forth in paragraph 19 above, except for a method / device wherein the discharge region is restricted on two sides by substrate surfaces at a distance of 1 mm to 50 cm apart (Claim 6), preferably at a distance of 1 to 10 cm apart (Claims 25 and 28). However, please note that the distance between substrate surfaces that restrict the discharge region of Yamada (i.e., the inside of the electrically conductive tube "7") is simply equivalent to the diameter / length across the tube itself. Yamada is silent as to this distance. However, it is the explicit desire of Yamada to coat a tube independent of size and shape (Abstract). Yamada also teaches that any tube, regardless of size and shape, can be utilized (page 422, section 4, as verified by an oral translation from a USTPO translator). Therefore, it would have been obvious to one of ordinary skill in the art to coat a tube of any diameter, including a tube having a diameter of between 1 and 10 cm, using the process of Yamada with the reasonable expectation of successfully and advantageously coating the tube, regardless of size and shape, with a simple apparatus as explicitly desired by Yamada.

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***Response to Arguments***

25. Applicant's arguments filed on 12/23/2002 have been fully considered but are not persuasive. Specifically, the applicant's arguments are moot in view of the new grounds of rejection presented above.

***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wesley D Markham whose telephone number is (703) 308-7557. The examiner can normally be reached on Monday - Friday, 8:00 AM to 4:30 PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shrive Beck can be reached on (703) 308-2333. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Wesley D Markham  
Examiner  
Art Unit 1762

  
WDM  
March 9, 2003

  
**SHRIVE P. BECK**  
**SUPERVISORY PATENT EXAMINER**  
**TECHNOLOGY CENTER 1700**